

of the achievement decline.^{56/} Moreover, higher-scoring teacher trainees are less likely to become teachers and, when they do, are more likely to leave the field for other occupations. The available data, however, do not indicate whether these latter two problems worsened during the period of the achievement decline.^{57/}

Cross-sectional research on the effects of teachers' academic achievement--as measured by tests such as the SAT and the ACT--on the achievement of their students is inconsistent. For example, one large-scale study of northern schools in the 1960s found that teachers' verbal abilities were consistently related to students' achievement.^{58/} In contrast, a large study of students in a single northeastern city found no relationship between teachers' scores on the National Teacher Examination and their students' test scores.^{59/} Nonetheless, it seems plausible that a deterioration of the academic skills of incoming teachers might in turn adversely affect the average test scores of their students.

Regardless of the cross-sectional research, however, the documented decline in the test scores of potential teachers, which began in the early 1970s, occurred too late to have contributed appreciably to the decline of students' test scores during the 1960s and 1970s. (The effects of any earlier deterioration of teachers' scores would be arguable, but, in any case, there are no data indicating whether one occurred.)

Most of the available data measure the academic achievement of a cohort of potential new teachers before they enter college--for example, the SAT and ACT scores of high school students planning to major in educa-

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56. Theodore C. Wagenaar, "Occupational Aspirations and Intended Field of Study in College" (Washington, D.C.: National Center for Education Statistics, unpublished, November 1984); College Entrance Examination Board, *College Bound Seniors* (New York: CEEB, various years); American College Testing Program, *College Student Profiles: Norms for the ACT Assessment, 1983-84* (Iowa City: ACT Publications, 1983).
 57. Victor S. Vance and Phillip C. Schlechty, "The Distribution of Academic Ability in the Teaching Force: Policy Implications," *Phi Delta Kappan*, vol. 64 (September 1982), pp. 22-27.
 58. Eric Hanushek, "The Education of Negroes and Whites," Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Massachusetts (1968), cited in Henry M. Levin, "A Cost-Effectiveness Analysis of Teacher Selection," *Journal of Human Resources*, vol. 1 (1970), pp. 24-33.
 59. Anita A. Summers and Barbara L. Wolfe, "Do Schools Make a Difference?" *American Economic Review*, vol. 67 (September 1977), pp. 639-652.

tion--rather than that of teachers themselves, and those students will not become teachers for at least five years, if at all. For example, a drop in the average SAT scores of students planning to become teachers between 1972 and 1973--the first years for which data are available--would have first affected the teaching work force in 1978, when the decline in test scores was essentially over. Even then, the impact on the average quality of the teaching work force would have been limited by the rate at which new teachers were hired, and the hiring of new teachers was restricted for much of the period of the achievement decline because of falling student enrollments. In 1970, for example, about 9 percent of all teachers in public schools were in their first year of teaching; that proportion had dropped to 5.5 percent in 1975 and to 1.6 percent in 1981.^{60/} If 5 percent of the teaching positions on average were filled by new teachers every year, the post-1973 cohorts with lower SATs would not have constituted a fourth of the teaching work force until at least 1982.

Beginning in 1980, the SAT scores of students expecting to major in education have risen appreciably (more rapidly than the scores of college-bound seniors as a whole). By the same logic, however, this change could not have contributed to the recent rise in students' test scores until 1985.

Teachers' Educational Attainment. The effects of teachers' educational attainment--that is, the highest level of education they have completed--on students' achievement remain controversial. (This specific question about the effects of teachers' educational attainment should not be confused with more general--and currently intensely controversial--questions about the value of pedagogical training.) One recent review, for example, noted that of 106 studies located, 95 showed no statistically significant effect of teachers' educational attainment. Of the remaining 11, about half found a positive relationship, and the remainder found a negative relationship.^{61/} Faced with these results, some researchers have concluded that teachers' educational attainment, at least beyond a bachelor's degree, has little or no effect on students' achievement, while others believe that methodological flaws underlie the absence of a relationship in many studies.

60. National Education Association, *Status of the American Public School Teacher, 1980-81* (Washington, D.C.: NEA, 1982), Table 6.

61. Eric A. Hanushek, "The Economics of Schooling: Production and Efficiency in Public Schools," *Journal of Economic Literature*, vol. 24 (September 1986), pp. 1141-1177.

Regardless of how one interprets this cross-sectional research, however, the educational attainment of practicing teachers offers no explanation for the test score decline because their educational attainment has risen without interruption for two decades. In 1960, about 15 percent of all public school teachers had less than a bachelor's degree, 62 percent had a bachelor's, and 23 percent had either a master's degree or six years of college-level education. In 1980, less than half a percent lacked a bachelor's degree. The proportion with only a bachelor's had dropped to about 50 percent, and those with either a master's degree (or six years) had risen to over 49 percent. 62/

Teachers' Experience. Trends in teachers' experience might have contributed to the recent rise in test scores but appear much less likely to have had any bearing on the previous decline. In both cases, however, the evidence is somewhat unclear.

Although cross-sectional research is quite inconsistent, it suggests that more experienced teachers may produce higher achievement in their students. One recent reviewer located 109 relevant studies; of the 40 that had statistically significant results, 33 showed higher achievement among students with more experienced teachers.63/ Another reviewer concluded that teachers' experience is related significantly to students' achievement only for the first five years of teaching. 64/

The mix of experienced and inexperienced teachers has changed substantially over the past two and a half decades, in part because trends in student enrollments altered the demand for new teachers. Assessing those changes, however, and gauging their temporal consistency with test score trends, are difficult. Experience can be measured in a number of ways, and trends in the various measures are not always consistent with each other. Changes in the proportion of teachers who are highly experienced, for example, do not keep pace with trends in the proportion who are novices. In addition, data on teachers' experience are drawn from a survey administered

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62. All data used here on trends in teachers' educational attainment, experience, and attitudes are from National Education Association, *Status of the American Public School Teacher, 1980-81*.
 63. Hanushek, "The Economics of Schooling." Studies with statistically insignificant results tended in the same direction, though less markedly.
 64. Susan J. Rosenholtz, "Political Myths About Education Reform: Lessons from Research on Teaching," *Phi Delta Kappan*, vol. 66, no. 5 (January 1985), pp. 349-355.

only once every five years, which leaves the precise timing of these trends unclear. ^{65/}

Teachers' average years of experience varied relatively little but was roughly consistent with the timing of achievement trends; it fell gradually from 13 years in 1960 to 10 years in 1975 and then rose again to 13 years in 1980. ^{66/} Only one of the more specific measures of changes in experience underlying those averages, however, lined up reasonably well with the timing of both the decline in test scores and the subsequent rise: the proportion of teachers with 20 or more years of experience. That proportion fell 28 percent in 1960 to 14 percent in 1975 and then rose to 22 percent in 1980. As noted earlier, however, there is some evidence that experience in excess of five years of teaching is not significantly related to students' achievement.

In contrast, the proportion of inexperienced teachers showed relatively little change during the period of declining test scores but fell sharply at roughly the time when test scores were rising. Between 1975 and 1980, the proportion of teachers with four or fewer years of experience dropped from 27 percent to 14 percent; the share with one or two years of experience fell from 11 percent to 5 percent; and the share with only one year of experience fell from 6 percent to 2 percent.

Other Characteristics of Teachers. The recent focus on the academic qualifications of teachers has perhaps obscured the question of whether there have been changes in other characteristics of teachers--such as their morale and attitudes toward students--that might influence student achievement. The limited data indicate that teachers' attitudes toward teaching have become increasingly negative over the past few decades. The proportion of public school teachers reporting that they would certainly become teachers again fell from about half in 1960 to 22 percent in 1980, while the proportion saying that they probably or certainly would not teach again grew from 11 percent to 36 percent. ^{67/} Whether these changes in attitudes are related to the achievement decline, however--either as causes or as responses--cannot be determined.

65. All estimates of teachers' experience discussed here are taken from NEA, *Status of the American Public School Teacher, 1980-81*.

66. The median amount of experience varied less than the mean: it was 11 years in 1961; 8 years in 1966, 1971, and 1976; and 12 years in 1981.

67. Ibid., Tables 51 and 52.

State and Local Graduation Requirements

At least 41 states have raised their coursework requirements for graduation in the past several years.^{68/} Part of the impetus for these changes was a widespread view that lax standards had contributed to the achievement decline.^{69/}

Regardless of whether state-mandated graduation requirements are too lax, they appear to have played no direct role in the achievement decline after 1974, for the requirements in effect in 1980 show remarkably little change from those of 1974.^{70/} Systematic data are not available for the earlier years of the decline, however, and there are no comprehensive data on trends in requirements imposed by local districts. If local requirements were substantially lowered or if state requirements were eased before 1974, those changes might have influenced test scores, although their effects would probably have been largely limited to the higher grades, and they would not have affected students whose course loads exceeded even the early standard. If such undocumented changes actually occurred, they might have contributed to the greater severity or later end of the decline in the higher grades.

If they were sufficiently lax, however, graduation standards could have contributed indirectly to the decline in scores even if the requirements did not change. If large numbers of students were exceeding the requirements by a substantial margin before the decline, and if some other factor--changes in students' attitudes, for example--caused them to seek an easier course load, lax standards would permit coursework to decline more than would be possible in the presence of stricter standards. To gauge whether graduation requirements had this sort of indirect role, it is necessary to consider changes in the actual coursework of students, which are assessed below.

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68. Margaret E. Goertz, *State Educational Standards: A 50-State Survey* (Princeton: Educational Testing Service, January 1986); see also "Changing Course: A 50-State Survey of Reform Measures," *Education Week*, vol. 4 (February 6, 1985), pp. 11-30.
 69. See, for example, National Commission on Excellence in Education, *A Nation at Risk: The Imperative for Educational Reform* (Washington, D.C.: Department of Education, April 1983), pp. 18, 20.
 70. National Association of Secondary School Principals, *Graduation Requirements and State-Mandated Graduation Requirements, 1980* (Washington, D.C.: NASSP, 1975 and 1980). If standards were too lax throughout this period, the achievement of certain students might have been lower as a result. Only modification of those requirements, however, not lax but stable requirements, could cause average scores to change.

Coursework

Evidence strongly suggests that changes in coursework at the secondary school level were substantial and could have contributed appreciably to the achievement decline in those grades. It is necessary, however, to distinguish the number of courses taken from the content and difficulty of those courses. Changes in the number of courses taken are germane primarily to students in grades 7 and above. Changes in course content and difficulty, on the other hand, can occur at all grade levels. While information about trends in elementary school coursework is lacking, there is evidence about both the number and content of secondary school courses. ^{71/}

That students scoring higher on achievement tests typically have taken more of the relevant courses is well established. Two nationally representative studies, for example, have found a sizable association between the amount of coursework in mathematics and mathematics test scores.^{72/} This association between coursework and test scores undoubtedly exaggerates the effects of coursework to some degree, because students who take more courses in difficult subjects have other characteristics--such as greater aptitude, prior achievement, and motivation--that would also contribute to their higher test scores. Nonetheless, research suggests that the independent effect of coursework on test scores is large. ^{73/}

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71. To the extent that textbooks both reflect and shape instruction, changes in texts--which are discussed in the following section--can also be seen as an indication of trends in course content.
 72. Wayne W. Welch, Ronald E. Anderson, and Linda J. Harris, "The Effects of Schooling on Mathematics Achievement," *American Educational Research Journal*, vol. 19 (Spring 1982), pp. 145-153; and Lyle V. Jones, "White-Black Achievement Differences," *American Psychologist*, vol. 3, no. 11 (November 1984), pp. 1207-1213.
 73. One recent, nationally representative study of seniors found that controlling for socioeconomic status, race, sex, and sophomore-year mathematics achievement left a large--though weakened--association between the number of core mathematics courses taken in high school and senior-year mathematics achievement. (Marshall Smith, Stanford University, unpublished analysis of the High School and Beyond survey.) Even after adjustment for these variables, the difference between the two extreme groups--those taking no mathematics courses and those taking algebra 1 and 2, geometry, and trigonometry--was nearly a full standard deviation. A portion of that remaining gap in test scores, however, might in part reflect still other confounding factors, such as motivational disparities among students choosing to take different numbers of mathematics courses.

Simple tabulations of the average number of courses taken by secondary school students, without regard to the content or difficulty of the courses, give varying results and do not consistently parallel achievement trends. For example, tabulations of the average number of courses per student in grades 7-12 of public schools show that enrollments in English and language arts courses increased slightly between the late 1940s and early 1970s; mathematics courses increased through 1970 (through the first half of the achievement decline), then dropped substantially over the next two years; and science enrollments rose slightly from 1960 to the early 1970s.^{74/} Data for seniors in the classes of 1972 and 1980 (a period covering the latter part of the decline and the first few years of the upturn in that grade) show a 10 percent increase in the average number of semesters of mathematics completed but a 13 percent decline in social studies and a 21 percent decline in foreign languages. Changes in English and science were trivial.^{75/}

The difficulty of the courses taken apparently decreased substantially, however, at least during the later half of the achievement decline. One indication of this is the marked shift out of academic programs noted earlier. A second indication is that the proportion of coursework devoted to remedial study soared. Between the 1971 and 1979 school years, for example, the proportion of seniors who had taken remedial mathematics grew more than sevenfold, from 4 percent to 30 percent. The proportion taking remedial English courses grew similarly.^{76/} Finally, enrollment in so-called fringe courses, such as science fiction, appears to have grown rapidly, and there is some evidence that enrollment in such courses--presumably, as a substitute for such core subjects as English composition--was associated with greater declines in SAT scores.^{77/}

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74. A. Harnischfeger and D. E. Wiley, *Achievement Test Score Decline: Do We Need to Worry?* (Chicago: CEMREL, Inc., 1975), Table 13.
75. W. B. Fetters, G. H. Brown, and J. A. Owings, *High School Seniors: A Comparative Study of the Classes of 1972 and 1980* (Washington, D.C.: National Center for Education Statistics, undated), Table 2.3.
76. Ibid.
77. The evidence pertaining to fringe course enrollments and their effects is not nationally representative but is nonetheless substantial. See Advisory Panel on the Scholastic Aptitude Test Score Decline, *On Further Examination* (New York: College Entrance Examination Board, 1977).

The narrowing of the achievement gap between black and nonminority students was also paralleled by slight increases in the number of courses taken by black high school students, relative to the courses taken by nonminority students. ^{78/} This increase in coursework, however, is probably in part an effect of other factors contributing to the narrowing achievement gap between black and nonminority students, rather than solely its cause. That gap in achievement has narrowed similarly in the lower grades--a pattern that cannot be attributed to course enrollments as such but that could reflect changes in the educational experiences of black students that are also manifested in changing senior-high course enrollments. ^{79/}

Minimum-Competency Testing

Some analysts who attribute part of the achievement decline to loosened educational standards also attribute the recent upturn to the growth of minimum-competency (or "competency" or "mastery") testing, which they see as part of a return to greater accountability and tougher standards. ^{80/}

Although the effects of competency testing remain a matter of vehement debate, the timing of the upturn in achievement indicates that the growth of competency testing, whatever its effects on test scores generally, did not help initiate the rise in scores. Most of the increase in state-mandated competency testing occurred in the late 1970s--that is, several years after the upturn in achievement first became apparent in the lower grades. Fewer than a third of the states had even mandated (let alone implemented) competency-testing programs by the end of 1976, by which time the upturn in achievement had already been under way a few years and

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78. Donald A. Rock, Ruth B. Eckstrom, Margaret E. Goertz, Thomas L. Hilton, and Judith Pollack, *Factors Associated with Decline of Test Scores of High School Seniors, 1972 and 1980* (Washington, D.C.: Center for Statistics, Department of Education, December 1985), Tables 6-48 through 6-52. In some instances, the number of relevant courses taken by black students increased more than the number taken by nonminority students; in others, black students showed a smaller decrease.
79. The data noted here do not address possible increases in the difficulty of the courses taken by black students, which--if they occurred at all--could have affected younger students as well.
80. See, for example, Barbara Lerner, "The Minimum Competency Testing Movement: Social, Scientific, and Legal Implications," *American Psychologist*, vol. 36 (October 1981), pp. 1057-1066.

had reached approximately grade 8.^{81/} Moreover, one would expect some delay before the effects of the new testing programs would have been fully manifested.

Textbook Difficulty

The role that changes in texts might have played in recent achievement trends remains unclear. Anecdotal reports of the "dumbing down" of textbooks are so widespread that they should not be discounted, but systematic evidence remains very sparse and is not entirely consistent with achievement trends. Moreover, cross-sectional data evaluating the impact that relevant changes in texts might have had on achievement is lacking.

Reading, Language Arts, and History. Most references to systematic data on the difficulty of textbooks reflect a single study commissioned by the Advisory Panel on the Scholastic Aptitude Test Score Decline.^{82/} This study examined texts in reading and literature, grammar and composition, and history at the first-, sixth-, and eleventh-grade levels published over a period of about five decades, beginning with the 1920s. It considered many aspects of text difficulty, including sentence length; vocabulary difficulty; demands for reading, writing, and reasoning in assignments; the degree of "child-centeredness" of the material; and the organization and coherence of the text.

While a number of striking changes were found, they varied markedly among grade levels and subject areas, and their timing was not entirely consistent with that of achievement trends.^{83/} For example, first-grade

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81. One recent review offered the following chronology: "...It appears that only two states had mandated minimum competency testing programs as early as 1971, that four more took similar actions in 1972, but that none were added during 1973 and 1974. In 1975, five more states enacted minimum competency testing programs, and four more were added in 1976....The rapid acceleration of the movement can be noted from data for 1977, when an additional nine states mandated...programs." (R. M. Jaeger, "The Final Hurdle: Minimum Competency Achievement Testing," in G. R. Austin and H. Garber, eds., *The Rise and Fall of National Test Scores* (New York: Academic Press, 1982), p. 228.)
 82. J. S. Chall, S. S. Conard, and S. H. Harris, *An Analysis of Textbooks in Relation to Declining SAT Scores* (New York: College Entrance Examination Board, June 1977).
 83. This partial consistency might explain why this study is cited both by those arguing that change in textbooks has been substantial (for example, Advisory Panel on the Scholastic Aptitude Test Score Decline, *On Further Examination*) and by those maintaining that change has been minor (for example, Christopher Jencks, "Declining Test Scores: An Assessment of Six Alternative Explanations," *Sociological Spectrum*, Premier Issue (December 1980), pp. 1-15.

readers were already becoming easier by the 1930s, and this trend continued at least until 1956 and, by some measures, for half a decade after that.^{84/} Since texts are used by students who take the SAT roughly 10 to 15 years after the publication date, progressively easier reading texts were used by both the cohorts responsible for the sharp rise in SAT scores in the late 1950s and early 1960s (that is, before the decline) and those that produced the first part of the decline.

Trends in sixth-grade reading texts showed even less consistency with SAT trends. During most of the period when the cohorts responsible for the SAT decline were attending sixth grade, basic readers were stable or increasing in difficulty. Cohorts taking the SAT in the late 1970s, whose scores marked the lowest point in recent years, used texts that were at least as difficult as those used by cohorts that took the SAT before the scores began to decline.^{85/} Trends in the difficulty of exercise questions included in the texts also failed to conform consistently to trends in the SAT. For example, the level of cognitive difficulty of questions in sixth-grade history texts was higher in texts published from 1965 through 1970--that is, in texts used by the cohorts that produced the second half of the SAT decline--than in texts published in the 1950s.^{86/}

The results of that study are also inconsistent with one of the most pervasive aspects of recent achievement trends: the greater severity of the decline in the higher grades. To the extent that a measurable lessening of reading difficulty was found, it tended to be more pronounced in the earliest grades, and the changes in the first-grade texts came closest to paralleling the timing of test score trends. One could easily posit a process by which changes in instruction in the earlier grades affect achievement in the higher grades as well. It is more difficult, however, to conceive of instructional changes that would have no impact for several years--there was no achievement decline in the first three grades--but would have progressively larger effects thereafter.^{87/}

84. Chall and others, *An Analysis of Textbooks*, Table 5.

85. Ibid., Table 6.

86. Ibid., Table 17.

87. The principal author of that study hypothesized that the achievement decline in the higher grades could indeed be explained by long-term effects of early reading instruction. See also Jeanne S. Chall, "Literacy: Trends and Explanations," *Educational Researcher*, vol. 12, no. 9 (November 1983), pp. 3-8.

Mathematics. The 1960s and 1970s saw some dramatic alterations to elementary mathematics texts that began with the incorporation of the "new math" in texts published between 1963 and 1965. (The new math had begun earlier but was not reflected in a major text until 1963.) The new texts also included fewer and simpler word problems, beginning a trend that continued for about a decade and a half.^{88/} These changes are consistent with the timing of the achievement decline and fit with the greater drop in performance in story problems and other applications compared with simple computation.

Texts used in the early 1980s and those recently introduced, which will be the standards for the latter half of the 1980s, show a marked increase both in the number of word problems and in the proportion of problems comprising more than a single step. Mathematics achievement scores began rising in the 1970s, however. In addition, the National Assessment found that during the time of the upturn, students improved least in the area of applications--a pattern that would not be expected if students spent more time practicing the solution of multistep word problems.

Although the return of word problems in mathematics textbooks thus could not have initiated the upturn in mathematics test scores, it might reflect a return to "old" mathematics that was already under way and might have reinforced whatever effects the prior change in course content had on achievement. Moreover, the latest National Assessment of mathematics was conducted in the 1981-1982 school year, and the effects of the most recent changes in texts might appear as increases in problem-solving ability only in subsequent assessments.

Homework

Time spent on homework dropped during the latter years of the achievement decline--at least among seniors--and has risen again recently. These changes might have contributed to trends in scores on achievement tests, but their effects were probably small.

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88. Susan R. Stockdale, "An Analysis of Elementary Mathematics Textbook Story Problems During the Eighties, and Comparisons to Earlier Eras" (doctoral dissertation, University of Iowa, Iowa City, May 1985); H. D. Hoover, Iowa Testing Programs, personal communication, October 1985.

Many cross-sectional studies show an association between achievement and the amount of homework done.^{89/} The extent to which this association reflects homework itself and not other factors (such as higher motivation, more substantial prior coursework, or the higher ability of students who do more homework) has not been fully determined, but it is reasonable to expect that, up to a point, increases in homework can raise test scores.^{90/}

According to reports by high school seniors, however, the decline in the average time spent on homework during the 1970s was small, and the average was already low. Between 1971 and 1979, the average time seniors reported spending on homework dropped from 4.3 to 3.9 hours per week--a decline of roughly 25 minutes a week. Oddly, the proportion of seniors doing no homework dropped, and the share doing more than 10 hours per week increased a bit (see Table A-1).^{91/} Between the 1979 and 1983 school years, both the amount of time spent on homework by 17-year-old students and the proportion of students assigned homework the previous day rose, but those changes too were small.^{92/}

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89. This association was found, for example, in Rock and others, *Factors Associated With Decline of Test Scores of High School Seniors, 1972 and 1980* (Washington, D.C.: Center for Statistics, Department of Education, December 1985), and in Timothy Z. Keith, "Time Spent on Homework and High School Grades: A Large-Sample Path Analysis," *Journal of Educational Psychology*, vol. 74, no. 2 (1982), pp. 248-253. In the most recent National Assessment of reading, on the other hand, the amount of homework done was unambiguously associated with achievement only in the oldest sample (age 17); see Bernice Anderson, Nancy Mead, and Susan Sullivan, "Homework: What Do National Assessment Results Tell Us?" (Princeton: NAEP/Educational Testing Service, December 1986).
90. Keith ("Time Spent on Homework and High School Grades") used nationally representative data to disentangle some of these confounding factors from the association between homework and class grades, but he did not control for prior coursework and controlled only inadequately for students' ability and prior level of achievement, because of limitations of the data.
91. W. B. Fethers, G. H. Brown, and J. A. Owings, *High School Seniors: A Comparative Study of the Classes of 1972 and 1980* (Washington, D.C.: National Center for Education Statistics, undated).
92. Anderson and others, "Homework: What Do National Assessment Results Tell Us?"

While the direct effect of this small change in homework was probably small, it might also have had an indirect bearing on achievement trends. The amount of homework might be a reflection of other correlated trends, such as changes in teachers' expectations and students' motivation, that in turn directly affect achievement.

Demands for Writing

Changes in schools' demands for writing have figured prominently in the recent debate--both as a possible cause of the achievement decline and as a component of efforts to improve education--and some states have recently added writing assessments to their battery of mandatory competency tests.

TABLE A-1. PERCENT OF HIGH SCHOOL SENIORS REPORTING VARIOUS AMOUNTS OF TIME SPENT ON HOMEWORK PER WEEK, 1971 AND 1979 SCHOOL YEARS

Amount of Time	1971	1979
None	11	8
Under 5 Hours	54	68
Five to 10 Hours	30	18
Over 10 Hours	6	6
Average Number of Hours Per Week	4.3	3.9

SOURCE: William Fethers, G.H. Brown, and J.A. Owings, *High School Seniors: A Comparative Study of the Classes of 1972 and 1980* (Washington, D.C.: National Center for Education Statistics, undated), Table 2.7.

Although anecdotal reports of a declining emphasis on writing are too widespread to dismiss out of hand, there appears to be little systematic evidence of such a decline. The Advisory Panel on the Scholastic Aptitude Test Score Decline concluded that demands for writing did fall, but it based that conclusion in part on the study of textbooks cited earlier, and the trends in demands for writing found in that study were not entirely consistent with achievement trends. For instance, the type and amount of writing required by sixth-grade reading texts and grammar and composition books were stable over the years studied.^{93/} Similarly, a comparison of the frequency with which seniors reported being assigned to write essays, themes, poetry, or stories changed only trivially between 1971 and 1979.^{94/}

As in the case of graduation standards, some of the apparent inconsistency between anecdotal and systematic information might represent the difference between low, but stable, demands and declining demands. Most observers would agree that the writing abilities of many American students need improvement. Yet trend data on actual writing--as opposed to proxies such as multiple-choice tests of English usage--are extremely sparse and do not paint a clear picture of declining performance.^{95/} Similarly, the fact that data on changes in demands for writing are limited and do not clearly show a decline in standards does not at all imply that demands for writing are adequate.

Grade Inflation

Many observers have cited "grade inflation"--the lowering of the level of achievement required to obtain a given grade--as a symptom of the lessened

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93. Chall and others, *An Analysis of Textbooks*, pp. 25, 32, and 33. In the case of grammar and composition books, the study reported a drop in the proportion of assignments requiring the writing of paragraphs, themes, stories, and so on (as opposed to single sentences and the like). This apparent trend, however, turns out to represent the texts of a single publisher; consideration of a single later text from a second publisher leads to the opposite conclusion (ibid., Table 13).
94. Rock and others, *Factors Associated with Decline of Test Scores*, Table 4-25.
95. For the most recent data on writing abilities, see National Assessment of Educational Progress, *The Writing Report Card* (Princeton: NAEP/Educational Testing Service, 1986). The most recent NAEP results are not comparable, however, to earlier data. For data on changes in writing performance, see National Assessment of Educational Progress, *Writing Achievement, 1969-1979* (Denver: NAEP/Educational Commission of the States, 1980).

demands of schooling during the last few decades and maintain that this trend contributed to the decline in achievement.

Although grade inflation at the secondary school level was clearly substantial and indicated declining educational demands, its link to the decline in test scores remains only speculative.^{96/} Available data are not adequate to appraise fully the consistency of this change in educational practice with the timing or details of the achievement trends. The data do, however, indicate one inconsistency between grading patterns and achievement trends that might suggest that the impact of the former on the latter was small: seniors in Catholic schools experienced no appreciable grade inflation but nonetheless showed declines in test scores roughly comparable to those of public school students.^{97/}

Educational Programs for Disadvantaged Students

Over the past several years, a number of observers have suggested that federally funded educational programs for disadvantaged students contributed to certain aspects of the achievement trends. The Title I (now Chapter 1) compensatory education program has been noted most often in this regard, but Head Start has also been mentioned.^{98/} This section

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96. For data on grade inflation, see Advisory Panel on the Scholastic Aptitude Test Score Decline, *On Further Examination*, p. 29; and National Center for Education Statistics, *The Condition of Education: 1982 Edition* (Washington, D.C.: Department of Education), p. 76.
 97. Ibid.; Rock and others, *Factors Associated with Decline of Test Scores*, Tables 5-1 through 5-3. Data on students in non-Catholic private schools were too scanty to draw meaningful conclusions.
 98. Statement by Archie E. Lapointe, Executive Director of the National Assessment of Educational Progress, before the House Subcommittee on Elementary, Secondary, and Vocational Education, Committee on Education and Labor, January 31, 1984; Archie E. Lapointe, "The Good News About American Education," *Phi Delta Kappan*, vol. 65 (June 1984), pp. 663-668; National Assessment of Educational Progress, *The Reading Report Card: Progress Toward Excellence in Our Schools* (Princeton: NAEP/ Educational Testing Service, 1985); National Assessment of Educational Progress, *Reading, Science and Mathematics Trends: A Closer Look* (Denver: NAEP/ Education Commission of the States, December 1982); National Assessment of Educational Progress, *Has Title I Improved Education for Disadvantaged Students? Evidence from Three National Assessments of Reading* (Denver: NAEP/ Education Commission of the States, April 1981).

assesses the contributions of these two programs to the relative gains of some minority groups and to the relatively favorable trends among younger children.

Head Start. Although existing research suggests that preschool programs for disadvantaged students can have diverse benefits, it does not indicate that Head Start contributed appreciably to the relative gains of black and Hispanic students observed in data on national achievement tests.

Over the past decade, a number of research reports have indicated that preschool programs for disadvantaged children can have lasting effects on school success.^{99/} For example, students in some programs are less likely to be placed in special education or to repeat subsequent grades in school. While these reports have led many observers to express optimism about the effects of Head Start, the extent to which the effects of those preschool programs indicate comparable effects of Head Start is a matter of debate. Few of the programs were actually Head Start programs; most were experimental programs run by researchers and probably differed significantly from the typical Head Start programs of the time. Some programs were small and thus provide only a weak basis for inferences about the nation as a whole; indeed, one of the most prominent studies--the Perry Preschool Project--included only 58 children in the experimental groups.

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99. This discussion of the general effects of Head Start and other preschool programs reflects the following studies: John R. Berrueta-Clement, Lawrence J. Schweinhart, W. Steven Barnett, Ann S. Epstein, and David P. Weikart, *Changed Lives: The Effects of the Perry Preschool Program on Youths Through Age 19* (Ypsilanti, Mich.: High/Scope Press, 1984); Urie Bronfenbrenner, *A Report on Longitudinal Evaluations of Preschool Programs, Volume II: Is Early Intervention Effective?* (Washington, D. C.: Department of Health, Education, and Welfare, 1976); Consortium for Longitudinal Studies, *Lasting Effects After Preschool* (Washington, D. C.: Department of Health, Education, and Welfare, 1979); Richard B. Darlington, Jacqueline M. Royce, Ann Stanton Snipper, Harry W. Murray, and Irving Lazar, "Preschool Programs and Later School Competence of Children from Low-Income Families," *Science*, vol. 208 (April 11, 1980), pp. 202-204; Head Start Evaluation, Synthesis and Utilization Project, *The Impact of Head Start on Children, Families and Communities* (Washington, D. C.: CSR, Incorporated, March 1985); Irving Lazar, Richard Darlington, Harry Murray, Jacqueline Royce, and Ann Snipper, "Lasting Effects of Early Education," *Monographs of the Society for Research in Child Development*, vol. 47, nos. 2-3, Serial no. 195 (1982); and New York State Education Department, *Evaluation of the New York State Experimental Prekindergarten Program* (Albany: The University of the State of New York, February 1982). The specific effects of Head Start on ethnic disparities in test scores are not assessed in those studies, however.

Evaluations of Head Start programs themselves do not fully clarify the extent to which their effects have been comparable. 100/

In addition, the documented long-term benefits of preschool programs generally have not included higher test scores. 101/ A great many programs--including some Head Start programs--have shown short-term improvement in intelligence (IQ) test scores, but these gains typically are largely or entirely eroded within several years. Assessments of effects on achievement test scores are much less common, and most show a similarly rapid erosion of gains. Evidence of these gains lasting into the secondary school years is very sparse and is found mostly in the smaller experimental programs. 102/

Moreover, even if Head Start raised achievement test scores, its contribution to the relative gains of minority students would be constrained by the substantial participation of nonminority students in the program. While black and Hispanic students are indeed overrepresented in the program relative to their numbers in the cohort as a whole, non-Hispanic whites nonetheless account for about a third of enrollments. In addition, relatively few children participate in the program, which further dilutes any effects on aggregate test scores. Head Start enrollments have generally ranged between 3 percent and 5 percent of children ages three to five. 103/

Given these considerations, it would be reasonable to expect Head Start to have raised the aggregate test scores of black and Hispanic students relative to those of nonminority students by perhaps 0.02 standard deviation one year after participation in the program, and perhaps by half or two-thirds that much two years after. (By contrast, the relative gains of

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100. Studies of Head Start's effects are numerous, but many are seriously flawed, and arguments about biases in even the more substantial evaluations are common. In addition, few studies of Head Start have followed students for the length of time required to assess long-term influences on school performance.
 101. The long-term effects that have received the greatest attention have been changes in other aspects of school success, such as changes in rates of assignment to special education.
 102. Berrueta-Clement and others, *Changed Lives*; Head Start Evaluation, Synthesis and Utilization Project, *The Impact of Head Start*; Lazar and others, "Lasting Effects of Early Education."
 103. Administration for Children, Youth, and Families, *Project Head Start Statistical Fact Sheet* (Washington, D. C.: Department of Health and Human Services, December 1985); Department of Commerce, Bureau of the Census, *Estimates of the Population of the United States by Age Sex and Race*, Series P-25, nos. 519, 917, and 1,000 (various years).

black students on the SAT were 0.16 and 0.21 standard deviation, depending on the subtest.) By the third year, however--that is, by the earliest grade reflected in the test score data discussed here--any effects of the program would be negligible.

Head Start could have contributed to the relatively favorable trends among younger students, but this effect would have been trivial because few children in each cohort attended the program. It is plausible, for example, that the program raised scores in the earliest grades by 0.01 standard deviation or less relative to scores in higher grades, but an effect of that size is negligible compared with the total difference in trends among age groups.

Title I/Chapter 1 Compensatory Education. Evaluations of the Title I/Chapter 1 program have consistently shown that the program has a small effect on achievement test scores. The evidence as a whole suggests that:

- o Gains in test scores of students in the program exceed those of comparable students not in the program by roughly 10 percent to 30 percent, depending on age and subject;
- o These gains are not large enough to narrow substantially the gap between program participants and other students;
- o The program's impact is greater in mathematics than in reading and larger in the lower grades than in the higher grades; and
- o The gains of participating students erode after students leave the program. 104/

In terms of its possible effects on disparities in test scores among ethnic groups, Title I/Chapter 1 differs from Head Start in three important respects. First, because students participating in the program are of school age and thus contribute to aggregate test scores while in the program, even transitory effects of Title I/Chapter 1 could narrow the gap between ethnic groups. In addition, Title I/Chapter 1 is a much larger program than Head Start--currently, about 14 percent of all students in kindergarten through grade 8 participate in the program--so any impact on the test scores of participating students has that much larger an effect on aggregate test

104. For a current overview of the copious research evaluating this program, see National Assessment of Chapter 1, *The Effectiveness of Chapter 1 Services* (Washington, D.C.: Department of Education, 1986).